

What Is Claimed Is:

1. A computer-implemented method of performing generational
garbage collection on a memory using a dynamic slidable window, the method
5 comprising:
 identifying a position in said memory at which a set of data expected to
become garbage within a finite period of time is to be stored;
 fixing a lower bound of a slidable window at said position, wherein said
window is configured to identify a young generation within the memory;
10 allowing an upper bound of said window to dynamically expand while said
lower bound is fixed; and
 after the set of data becomes garbage:
 un-fixing said lower bound; and
 decreasing a size of said window.
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2. The method of claim 1, further comprising, prior to said
identifying:
 receiving an alert from an entity configured to have knowledge of a nature
of the set of data.
- 20
3. The method of claim 1, further comprising, prior to said
identifying:
 receiving notification that the set of data is to be stored in said memory.
- 25
4. The method of claim 3, wherein said identifying comprises:
 identifying a location of an allocation point in said memory at the time
said notification is received.

5. The method of claim 1, wherein the size of said window grows as said upper bound dynamically expands.

5 6. The method of claim 1, further comprising, after the set of data becomes garbage:

garbage-collecting the young generation.

7. The method of claim 1, further comprising, prior to said fixing:
10 garbage-collecting the young generation.

8. The method of claim 1, wherein said decreasing comprises:
setting the size of the window to a predetermined size.

15 9. The method of claim 1, wherein:
during allocation of said memory prior to said fixing:
said lower bound and said upper bound are configured to slide
simultaneously; and

the window maintains an unchanging size; and
20 during allocation of said memory after said fixing:

said lower bound does not slide;

said upper bound expands; and

the window dynamically changes size.

25 10. A computer readable storage medium storing instructions that,
when executed by a computer, cause the computer to perform a method of
performing generational garbage collection on a memory using a dynamic slidable

window, the method comprising:

identifying a position in said memory at which a set of data expected to become garbage within a finite period of time is to be stored;

- 5 fixing a lower bound of a slidable window at said position, wherein said window is configured to identify a young generation within the memory;
- allowing an upper bound of said window to dynamically expand while said lower bound is fixed; and
- after the set of data becomes garbage:
- un-fixing said lower bound; and
- 10 decreasing a size of said window.

11. A method of generational garbage collection using a dynamic window, the method comprising:

- in a generational garbage-collected memory, defining a young generation
- 15 with a slidable window having a lower bound and an upper bound;
- fixing said lower bound in a position; and
- allowing said upper bound to expand while said lower bound is fixed in said position.

- 20 12. The method of claim 11, further comprising, after said allowing: garbage-collecting the young generation; and
- un-fixing said lower bound.

13. The method of claim 11, further comprising, prior to said fixing:
- 25 receiving a first notification regarding storage, in the memory, of data expected to become garbage in a finite period of time.

14. The method of claim 13, further comprising, after said allowing:
receiving a second notification that said data have become garbage.

5 15. The method of claim 13, further comprising, after said allowing:
observing the passage of a predetermined period of time.

16. The method of claim 11, wherein said allowing comprises:
incrementing said upper bound while said lower bound is fixed in said
position.

10 17. The method of claim 11, wherein said fixing comprises:
identifying a position in the memory at which temporary data are to be
stored; and
setting said lower bound at the identified position.

15 18. The method of claim 11, wherein said fixing comprises:
identifying a position in the memory where temporary data are stored; and
setting said lower bound at the identified position.

20 19. The method of claim 11, wherein said fixing comprises:
determining that a set of data that will become garbage in a relatively short
period of time will be stored in the memory;
wherein said position is the position at which the set of data are or will be
stored.

25 20. A computer readable storage medium storing instructions that,
when executed by a computer, cause the computer to perform a method of

generational garbage collection using a dynamic window, the method comprising:

in a generational garbage-collected memory, defining a young generation with a slidable window having a lower bound and an upper bound;

fixing said lower bound in a position; and

5 allowing said upper bound to expand while said lower bound is fixed in said position.

21. A computer readable storage medium containing a multi-generational data structure configured to be garbage-collected, the data structure
10 comprising:

a young generation comprising data recently stored in the data structure, wherein said young generation is defined by a window having:

a lower bound; and

an upper bound; and

15 an old generation comprising data that have survived one or more garbage collections of said young generation;

wherein during a normal phase of allocation of the data structure:

said lower bound and said upper bound slide simultaneously; and

said window maintains an unchanging size; and

20 wherein during a temporary phase of allocation of the data structure:

said lower bound is fixed in a set position;

said upper bound is dynamically expandable; and

said window changes size as said upper bound dynamically expands.

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22. An apparatus for performing generational garbage collection, comprising:

a memory having an old generation and a young generation;
a slidable window for defining said young generation, said slidable
window comprising:

- 5 a lower bound configured to be fixed in a selectable position; and
- an upper bound configured to slide after said lower bound is fixed;
- a garbage collector configured to perform garbage collection on one or
more of said old generation and said young generation; and
- a memory allocator configured to:
 - 10 allocate the memory in a normal manner when said lower bound
and said upper bound slide simultaneously; and
 - allocate the memory in a temporary manner when said lower bound
is fixed.

- 23. The apparatus of claim 22, wherein:
 - 15 said slidable window maintains an unchanging size while said memory
allocator allocates memory in said normal manner; and
 - said slidable window expands in size while said memory allocator
allocates memory in said temporary manner.

- 24. The apparatus of claim 22, wherein said apparatus is configured to
20 fix said lower bound and allocate memory in said temporary manner when a set of
data stored in said memory is expected to become garbage within a finite period
of time.

- 25. The apparatus of claim 24, wherein said apparatus is configured to
25 un-fix said lower bound and allocate memory in said normal manner after said set
of data becomes garbage.

26. The apparatus of claim 24, wherein said selectable position is a position at which the set of data is stored.

5 27. The apparatus of claim 24, wherein said selectable position is a position at which the set of data will be stored.

28. An electronic device, comprising:
a processor;
10 a garbage-collectable memory having:
an old generation of memory; and
a young generation of memory defined by a slidable window
having a lower bound and an upper bound;
a garbage collector for controlling garbage-collection of said memory;
15 executable code configured to:
alert said garbage collector a first time when data to be stored in
said memory are expected to become garbage in a relatively short period
of time; and
alert said garbage collector a second time when said data have
20 become garbage;
wherein, in response to said first alert, said lower bound is fixed in a
position and said upper bound is allowed to expand; and
wherein, in response to said second alert, said lower bound is un-fixed.

25 29. The electronic device of claim 28, wherein, in response to said second alert, said upper bound is retracted to return said slidable window to its size prior to said first alert.

30. The electronic device of claim 28, wherein, in response to said second alert, said garbage collector garbage-collects said young generation.

5 31. The electronic device of claim 28, wherein said electronic device is a telephone.

32. The electronic device of claim 28, wherein said electronic device is a computer.

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33. The electronic device of claim 28, wherein said executable code comprises a Java Virtual Machine.

34. The electronic device of claim 28, wherein said executable code
15 comprises a compiler.